

## THE PROBLEM OF EXPERIMENTER FRAUD: A RE-EVALUATION OF HANSEL'S CRITIQUE OF ESP EXPERIMENTS

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The recent discovery of experimenter fraud at the highest level of ESP research (Rhine 1974, 1975) and new evidence of fraud in some of the classical experiments in the field (Markwick, 1978) are disturbing. These revelations suggest that C. E. M. Hansel's critique of ESP experiments—a critique based on the real possibility of experimenter fraud—needs re-evaluation, for in the light of them it may seem much less easy than before to dismiss Hansel's argument.

In this paper I will consider Hansel's well-known critique of ESP experiments. It rests on two different arguments. It will be shown first that his critique based on what will be called "the argument from impossibility" is much too strong: if it were generalized it would rule out all scientific revolution in science. It will then be shown that his critique based on what will be called "the argument from improbability" may, if generalized, conflict with some cases of scientific revolution in science. Finally, the question of what a reasonable policy concerning experimenter fraud would consist of will be considered in the light of the recently discovered cases of fraud in the field of psychical research.

### BACKGROUND OF HANSEL'S CRITIQUE

Many investigators have pointed out that the results of successful ESP experiments are *prima facie* inexplicable in terms of some present well-established scientific laws and theories (Broad, 1949). For example, the apparent ability of some subjects in telepathy experiments to obtain information concerning the thoughts of another without making inferences based on the other's behavior is not explicable in terms of present scientific principles about how information is obtained. Indeed, the results of successful ESP experiments are ostensibly paranormal, for one defining characteristic of the paranormal is that a phenomenon is not explicable in terms of

well-established laws and theories.

This is not to say, of course, that everything that is not explicable in terms of present well-established laws and theories is paranormal. Cancer and the common cold are not presently explicable scientifically, yet they are obviously not paranormal. These cases have prompted philosophers to suggest other defining characteristics of the paranormal besides that of not being presently scientifically explicable. One plausible suggestion is that something is paranormal only if it cannot be explained scientifically *without* major scientific revolution. This suggestion rules out the common cold and cancer as paranormal, for presumably it would not take a major scientific revolution in order to explain either one. But even this suggestion does not completely capture what is meant by "paranormal" (Braude, 1978); for there are phenomena in the history of science which are not considered paranormal, yet which cannot be explained without a major conceptual revolution. Still, at least a necessary condition, if not a sufficient condition, of some phenomenon *P* being paranormal is:

(I) *P* cannot be explained scientifically without a major scientific revolution.

When do the results of ESP experiments actually meet Condition I?

Clearly two necessary conditions would have to be met before ESP experiments could be claimed to justify a scientific revolution. First, since the results of ESP experiments are based upon statistical data, it must be shown that there is an extremely low probability of these results occurring by chance. Modern successful ESP experiments have surely met this condition; indeed, meeting this condition is part of what is meant by saying these experiments are successful. Second, non-ESP explanations of the results of the experiments must be eliminated. Certainly this last condition is the most difficult to meet, for it would involve eliminating various conventional explanations of the results of ESP experiments. For example, it would involve showing that the results of ESP experiments are not due to the subject utilizing various sensory clues and cues, that the subject of the experiment is not cheating, and so on.

#### HANSEL'S POSITION

Hansel's view can be understood in the light of this background. According to Hansel, one non-ESP hypothesis that would explain

the successful results of ESP experiments and which has not been eliminated is the hypothesis of experimenter fraud; that is, the hypothesis that the experimenter, either alone or in conjunction with others, has fudged the data or tampered with the experiment's design, or used an elaborate code, etc. Let us call this the experimenter-fraud hypothesis (EFH). Hansel's basic argument then can be formulated in this way:

- (1) If one is justified in accepting ESP as real, EFH must be eliminated.
- (2) EFH has not been eliminated.
- (3) Therefore one is not justified in accepting ESP as real.

Since one is not justified in accepting ESP as real, one is not justified in supposing it to be paranormal; consequently one is not justified in supposing that to explain ESP experiments a scientific revolution is necessary.

Clearly the key premise in the above argument is premise (2). How does Hansel attempt to establish it?

#### THE ARGUMENT FROM IMPOSSIBILITY

One reason Hansel gives for believing that EFH has not been eliminated is that fraud has not been shown to be impossible. If the results of an ESP experiment *could* have been gotten by a trick or by cheating, then according to Hansel EFH has not been eliminated and, consequently, one can not assume that ESP is established (Hansel, 1966, p. 17). Hansel thus attempts to establish premise (2) by the following argument:

- (2a) If EFH is eliminated, fraud must be shown to be impossible.
- (2b) But fraud has not been shown to be impossible.
- (2) Therefore EFH is not eliminated.

Hansel attempts to argue for (2b), in turn, by considering classical ESP experiments which parapsychologists tend to agree establish the reality of ESP. He attempts to show in each case that experimenter fraud is possible. For example, in the Soal-Goldney experiment he points out that there are various ways in which the experimenter, sometimes with the help of the subject, could have cheated (Hansel, 1966, chap. 9). Although he attempts to bring up evidence that suggests that cheating did go on in this experiment, it is not necessary for his purposes to do so. It is enough for him to show

that experimenter fraud is *possible*, and this he does quite easily, not only in the Soal-Goldney experiment but in other classical experiments as well.

#### CRITIQUE OF THE ARGUMENT FROM IMPOSSIBILITY

The trouble with the argument from impossibility is premise (2a). It is false. (2a) can be shown to be false by considering the absurd consequences that would follow from it. One such consequence would be that no scientific revolution would ever be justified.

As was mentioned above, ESP is a special case of the paranormal. But the paranormal is itself a special case of the anomalous. By definition an anomalous phenomenon is one that does not fit into our present scientific framework and requires for its explanation a scientific revolution (Kuhn, 1962). Thus, although Condition I above is not a sufficient condition for a phenomenon to be paranormal (although it is a necessary condition) it is a sufficient condition for a phenomenon to be anomalous.

Now this means that Hansel's argument from impossibility can be generalized as follows. In all cases where there are *prima facie* anomalous phenomena, i.e., in all cases in which there seem to be phenomena that would justify a scientific revolution, if experimenter fraud has not been shown to be impossible, the phenomena cannot be accepted as really anomalous and consequently a scientific revolution would *not* be justified. Please recall that one need not show that fraud is probable, but only possible. Given Hansel's view, therefore, it would be easy to show that no scientific revolution was ever justified since fraud is *always* possible, even if very improbable.

The argument formally stated is:

- (1) If one is justified in accepting any phenomenon *P* as really anomalous, EFH must be eliminated.
- (2a) If EFH is eliminated, fraud must be shown to be impossible.
- (2b) But fraud has not been shown to be impossible.
- (3) If one is justified in overthrowing well-established scientific theories and laws, one is justified in accepting some phenomenon as anomalous.
- (4) Therefore one is not justified in overthrowing well-established theories and laws.

Since premise (2b) can easily be shown to be true in all cases of sci-

entific revolution and premises (1) and (3) are true, the absurd conclusion (4) is the result of (2a).

The only way I can see for Hansel to get out of this problem is to specify some clear difference between paranormal phenomena and anomalous phenomena that are not paranormal that would justify the use of his argument but not justify the generalized version of the argument I have constructed. Since I see no way of his doing this, I must conclude that the argument from impossibility fails.

#### THE ARGUMENT FROM IMPROBABILITY

At times Hansel seems to believe that EFH has not been eliminated, not because fraud has not been shown to be impossible, but because EFH is more likely than any ESP hypothesis. He says:

In parapsychological research the process being investigated is both hypothetical and *a priori* extremely unlikely. Any possible known cause of the result is far more likely to be responsible for it than the hypothetical process under consideration (Hansel 1966, p. 17).

On this interpretation Hansel's argument for (2b) is then:

(2a') If EFH is eliminated, then EFH must be less probable than the ESP hypothesis.

(2b') But EFH is not less probable than the ESP hypothesis.

(2) Therefore EFH is not eliminated.

How could (2b'), the crucial premise, be established? One would have to compare the probability of EFH with the probability of an ESP explanation and show that the probability of EFH was not less than the probability of the ESP hypothesis.

It is well known that the probability of a hypothesis is a function of two things: the relevant background information and the new evidence for the hypothesis. These ideas can be specified as follows. Let

$h_1$  = ESP hypothesis,

$h_2$  = EFH,

$k$  = relevant background information,

$e$  = new evidence.

$P(h_1, k)$  = The probability of  $h_1$  relative to  $k$ ,  
(antecedent probability of  $h_1$ ).

$P(h_2, k)$  = The probability of  $h_2$  relative to  $k$ ,  
(antecedent probability of  $h_2$ ).

$P(h_1, e + k)$  = The probability of  $h_1$ , relative to  $e + k$ ,  
(posterior probability of  $h_1$ ).

$P(h_2, e + k)$  = The probability of  $h_2$ , relative to  $e + k$ , (posterior  
probability of  $h_2$ ).

Now  $P(h_1, k)$  is no doubt much lower than  $P(h_2, k)$ . Indeed, it is so much lower that very good new evidence would have to be forthcoming to make  $P(h_1, e + k) > P(h_2, e + k)$ . Is such evidence available?

#### CRITIQUE OF THE ARGUMENT FROM IMPROBABILITY

It is important to realize that in order to establish (2b') evidence must be weighed and evaluated. It is not enough, as in the argument from impossibility, merely to show that EFH is possible.

In his evaluation of *some* classical ESP experiments Hansel does in fact try to show that EFH is likely in the light of the evidence he cites. Whether he is successful in showing EFH to be *more* probable than the ESP hypothesis in these experiments we need not decide here, for Hansel makes no explicit attempt to show that EFH is probable, let alone more probable than the ESP hypothesis, in the evaluation of *other* ESP experiments. For example, in the Pearce-Pratt series of experiments he makes no such attempt; he deals only with the possibility (not the probability) that the percipient Pearce may have cheated (Rhine & Pratt, 1961). So, in his explicit evaluation of these experiments (2b') has not been established; indeed, no explicit attempt has been made to establish (2b') in this case.

Nevertheless, Hansel does provide some clues as to the sort of argument which would establish (2b'), the sort of argument he would want before one could assume  $P(h_1, e + k) > P(h_2, e + k)$ . He suggests in several places that in order to make  $P(h_2, e + k)$  very low—presumably lower than  $P(h_1, e + k)$ —the experiment should be repeated by independent investigators. He says:

Repetition after repetition of an ESP experiment by independent investigators renders the possibility of deception or error extremely unlikely and thus, if the original result is confirmed, the probability of ESP becomes increasingly likely (Hansel, 1966, p. 18).

He also suggests in his criticism of the Soal-Goldney experiment:

If above-chance scores had been obtained when all the regular investigators were absent, or if a critical observer had been left free to change the experimental conditions imposing his own safe guards, a possible result would have been vastly more impressive (Hansel, 1966, p. 128).

These and other remarks made by Hansel suggest that the presence of certain safeguards against experimenter fraud, in particular repetition of the experiment by independent investigators, is at least a necessary condition (and perhaps a sufficient condition) for showing that  $P(h_1, e + k) > P(h_2, e + k)$ . Thus Hansel seems to assume that in order to establish (2b') it is sufficient to establish the falsity of:

(II) ESP experiments have been successfully repeated by independent investigators.

Hansel seems to assume that if Condition II has not been met, the probability of EFH could not possibly be lower than the probability of the ESP hypothesis. Hansel's argument would be complete if he had gone on to show explicitly that in each classical ESP experiment Condition II had not been met. He does not do this explicitly, but he certainly does seem to assume that Condition II is false for all well-known ESP experiments. Is he correct? No, he is not.

There seems to be at least one series of experiments in ESP research that meets Condition II, namely, the experiments with Pavel Stepanek. Successful ESP experiments have been conducted with Stepanek for nearly a decade by independent investigators with and without Ryzl's help, in and out of surroundings familiar to Stepanek, with and without material familiar to Stepanek (Beloff, 1968; Pratt, 1973; Pratt et al., 1968). Although it is possible, of course, that these various independent experimenters—experimenters from over a half-dozen countries and laboratories—are involved in some great conspiracy, EFH is very unlikely in this case. So it would seem that Condition II has been met at least in this series of experiments.

It is curious that when Hansel mentions the Stepanek experiment he says nothing of the fact that Stepanek has been tested by many independent investigators; indeed, as has been pointed out by at least one reviewer, Hansel badly misunderstood the experiment (Stevenson, 1967). It is because of this sort of heavy-handed treatment that Hansel, although the best known scientific critic of ESP research, is also considered unfair and biased by many people in the field. Here at least there seems to be a clear case in which all of Hansel's suggested safeguards against experimenter fraud were utilized, and yet Hansel ignores them completely.

#### THE GENERALIZATION OF THE IMPROBABILITY ARGUMENT

I have argued so far that (i) Hansel does not directly or explicitly

attempt to establish (2b'); but that (ii) his implicit argument for (2b'), if correctly understood, fails in that there is at least one series of ESP experiments (the experiments with Pavel Stepanek) in which Hansel's requirement of testing by independent investigators has been met.

Hansel's ideas about ESP can be generalized as a policy concerning anomalous phenomena and scientific revolutions. The policy can be stated as follows.

Policy  $P_1$  = No well-established scientific laws and theories should be rejected because of apparent anomalous phenomena until EFH is made extremely improbable through the successful repetitions of the experiment by independent investigators.

One serious question about policy  $P_1$  is whether it is too strong; that is, whether the  $P_1$  would conflict with justified cases of scientific revolutions. There will be no attempt here to review the history of scientific revolutions in order to consider whether there are apparent conflicts between  $P_1$  and what are considered legitimate cases of scientific revolutions, but my strong impression is that there are such cases.

However, even if there are no actual instances of  $P_1$  conflicting with legitimate cases of scientific revolution, there surely could be such cases. My reason for saying this is that whether EFH needs to be made improbable in the way  $P_1$  suggests is a function of the field of inquiry, and fields of inquiry may vary. There could be a field in which there is no reason to suspect experimenter fraud or trickery, one in which there is a long, unblemished tradition of scientific honesty. In such a field independent confirmation would not be needed, for the improbability of EFH is guaranteed not by *direct* evidence produced by independent investigators, but by background information about the field. Thus, in terms of the symbols introduced earlier  $P(h_2, k)$  would be very low. Indeed, one could argue that the probability would be so low that testing by independent investigators would not lower the probability in any significant way.

In other fields in which there is evidence of fraud and widespread suspicion of fraud, special considerations aimed at making EFH improbable may be needed. This suggests a weaker and, I believe, a more plausible policy:

$P_2$  = No well-established scientific laws or theories should be rejected because of apparently experimental anomalous phenomena in a field where there is experimenter fraud and



widespread suspicion of experimenter fraud until EFH is made extremely improbable through successful repetition of the experiment by independent investigators.

Now past and present cases of experimenter fraud in ESP research certainly seem to suggest that at the present time  $P_2$  is a policy that it would be wise to follow in ESP research. Following such a policy consistently would, it might be thought, do all that one could do to give people in and out of the field justified confidence that experimental fraud is under control. But even  $P_2$  may be too strong as a general policy. A recent paper by J. B. Rhine (1975) suggests that Condition II above is not a necessary condition for justifiably believing that  $P(h_1, e + k) > P(h_2, e + k)$  in parapsychology; consequently even in a field where fraud occurs and the suspicion of fraud is widespread, the probability of fraud can be shown in certain cases to be very low without the ESP experiments having been repeated by independent investigators.

There is a certain kind of evidence—what Rhine calls the “hidden evidence of psi”—that Rhine claims is fraud-proof, evidence independent of the evidence produced by repetition of the experiment by independent investigators. To use some examples of Rhine’s: Some experimenters have done successful ESP experiments with positive results and have not published these results. In such cases the motivation for fraud (fame gained in publication) is absent. In other cases, research has been published, but the significance of the research has only become clear to later investigators, not to the investigator who published the research. Here again EFH seems ruled out. Thus Estabrooks’s experiment in 1925 showed evidence of psi-missing, a phenomenon that at the time had no significance; it was only years later that the significance of this and other peculiarities of the experimental results were noticed.

As Rhine notes, hidden fraud-proof evidence of psi is not well adapted to most test situations. Indeed, by its very nature such evidence does not seem to be the sort of thing one can plan for and deliberately create. As a result, its use in eliminating EFH is very limited. Furthermore, and more importantly for our purpose, such evidence does not seem available in the classical experiments that are cited by people in the field as establishing the reality of ESP, the very experiments criticized by Hansel. Nevertheless, fraud-proof evidence may be important in other fields in eliminating EFH and in establishing the results of the classical experiments of the field. So, although fraud-proof evidence at the present time does not meet

Hansel's objection to ESP research, the possible use of fraud-proof evidence should be incorporated into a general policy concerning experimenter fraud, a policy meant to apply to all fields of inquiry. This policy can be stated as follows:

$P_3$  = No well-established scientific laws or theories should be rejected because of apparently experimental anomalous phenomena in a field in which experimenter fraud or suspicion of experimenter fraud is widespread until EFH is made extremely improbable by the experiment being repeated successfully many times by independent investigators or by "fraud-proof hidden evidence."

"Fraud-proof hidden evidence" is to be understood as evidence that is incompatible with the experimenter's motive for perpetrating a fraud or evidence whose significance could not be understood by the experimenter at the time the evidence was produced.

#### SUMMARY AND CONCLUSION

Given the recent discovery of fraud in parapsychology, Hansel's critique deserves another look. That look reveals that Hansel has used two different arguments to refute the reality of ESP. One argument—the argument from impossibility—is unsound because it is based on a false premise. It is true that EFH has not been shown to be impossible in classical ESP experiments; however, by the same token, EFH has not been shown to be impossible in any case of scientific revolution where the anomalous nature of the evidence is an issue. So Hansel's argument from impossibility, if generalized, would rule out all scientific revolution. Hansel's other argument—the argument from improbability—does not show that in *all* ESP experiments EFH is more probable than the ESP hypothesis. Indeed, in some cases Hansel does not explicitly *attempt* to show this by citing evidence. Nevertheless, he does offer an idea about when one can assume that the probability of EFH is low: when the experiment has been repeated successfully many times by independent investigations. It is argued that this criterion has been met in at least the case of the Stepanek series of experiments.

When the idea derived from Hansel's argument from improbability is made into a generalized policy, it is not appropriate in fields of research with a long, unblemished history of honesty. Furthermore, Rhine's work suggests that even in a field where experimenter fraud is widespread, EFH may be made improbable by what

Rhine has called "hidden fraud-proof evidence." Thus, Hansel's criterion is not a necessary condition for showing that the probability of EFH is very low in all fields, even all fields where experimenter fraud is found. In ESP research, however, it is not clear that such hidden evidence can meet Hansel's specific charges against classical ESP experiments. Successful repetition of experiments by independent investigation seems the best course of action to meet Hansel's specific charges.

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